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EXAMINER

VAZQUEZ, ARLEEN M

ART UNIT	PAPER NUMBER
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2829

NOTIFICATION DATE	DELIVERY MODE
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09/04/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/558,385	Applicant(s) ITO ET AL.	
	Examiner ARLEEN M. VAZQUEZ	Art Unit 2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05/27/2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,4-19,21 and 23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2,4-19,21 and 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 19 and 23 are objected to because of the following informalities:

Claim 19 lacks of antecedent basis because depend from canceled claim

1. It should depend from claim 2 to meet the antecedent basis requirement. For examination purposes will be treated as dependent from claim2.

Claim 23 in line 15 the limitation of “by the moving device from the second image” should be changed to “by the moving device from the third image” and in line 18 the limitation of “by the moving device from the third image” should be changed to “by the moving device from the second image” to meet antecedent basis requirement.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2,5 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Reynolds et al. (US 5,547,537)** in view of **Farnworth et al. (6,150,828)** further in view of **Bartschat et al. (US 4,980,971)**.

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As to claims 2,5 and 21, **Reynolds et al.** discloses in Figures 1 and 2 an electronic device test apparatus for testing DUTs by pushing their input/output terminals against contact units of a test head, comprising a moving device (10) to pick up and move the DUTs (26) and has a suction device (24) configured to hold and pick up the DUT (26) by suction, a first imaging device (50) configured to capture an image of one surface (surface of die facing up to imaging means 50 opposed to surface 28) of the DUT (26) before being picked up by the moving device (10), a second imaging device (52) configured to capture an image of the other surface (28) of the DUT (26) after being picked up by the moving device (10), and a calculating device (controller and computer connected to system 50,52,54 and 56, Col. 3 lns 4-22,32-47, Col. 5 ln47-Col.6 ln2) configured to calculate the position (X,Y) and posture (angle) of the DUT (26) picked up by the moving device (10) from the image information captured by the first imaging device (50) and the second imaging device (52) and calculating the relative position (X,Y) and posture (angle) of the DUT (26) picked up by the moving device (10) with respect to a contact unit (40) based on the results of calculation (Col. 6 lns 46-51), wherein the moving device (10) corrects the position (X,Y) and posture (angle) of the DUT (26) based on the relative position and posture of the DUT identified by the calculating device (Col. 6 lns 46-51), but fails to teach a calculating device configured to calculate the position and posture of the outside shape of said one surface of the DUT before being picked up by the moving device and the position and posture of the input/output terminals of said DUT before being picked up by the moving device from image information captured by

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the first imaging device, calculate the position and posture of the outside shape of the other surface of the DUT after being picked up by the moving device from image information captured by the second imaging device, and calculate the position and posture of the input/output terminals of the DUT after being picked up by the moving device based on the results of these calculations.

However, **Farnworth et al.** discloses a calculating device (computer, Col. 9 Ins 66-67, Col. 12 Ins 58-64) configured to calculate the position (X,Y) and posture (angle of DUT 202) of the outside shape (by find rulers, Col. 10 Ins 9-24) of said one surface of the DUT (202) before being picked up by the moving device (52 Fig. 3B) and the position and posture of the input/output terminals (204, Fig.15) of the DUT (202) before being picked up by the moving device (52) from image information captured by the first imaging device (24, Figs.3B and 4), calculate the position (X,Y) and posture (angle) of the outside shape of other surface (sides of DUT 202, Col. 11 Ins 24-27) in said DUT (202) after being picked up by the moving means (52) from image information captured by the second imaging device (30 Fig.1, Col.11 Ins 22-35), and calculate the position and posture of the input/output terminals (204) of the DUT (202) after being picked up by the moving device (52) based on the results of these calculations (Col. 11 Ins 31-67).

It would have been obvious for one ordinary skill in the art at the time the invention was made to modify the teachings of **Reynolds et al.** by having calculations based on the information received from the imaging means based on position and posture of the DUT as taught as **Farnworth et al.** to assure quality

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of the DUT's based on images taken by having the correct positioning and alignment of the DUT's when are being photograph by the imaging devices.

The combination of **Reynolds et al.** in view of **Farnworth et al.** discloses everything above except for a first imaging device configured to capture an image of a front surface of the DUT on which the input/output terminals are led out before being picked up by the moving device; a second imaging device configured to capture an image of a back surface of the DUT on which the input/output terminals are not led out after being picked up by the moving device.

However, **Bartschat et al.** discloses in Figure 1 and 2 a first imaging device (40) configured to capture an image of a front surface of the DUT (16) on which the input/output terminals (14) are led out before being picked up by the moving device (22) and a second imaging device (38) configured to capture an image of a back surface (surface where no terminals are exposed) of the DUT (16) on which the input/output terminals (14) are not led out after being picked up by the moving device (22).

It would have been obvious for one ordinary skill in the art at the time the invention was made to modify the combined teachings of **Reynolds et al.** and **Farnworth et al.** by having a first imaging device configured to capture an image of a front surface of the DUT on which the input/output terminals are led out before being picked up by the moving device; a second imaging device configured to capture an image of a back surface of the DUT on which the input/output terminals are not led out after being picked up by the moving device as taught as **Bartschat et al.** to assure quality of the DUT's based on images

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taken by having the correct positioning and alignment of the input/output terminals of the DUT's when are being photograph by imaging device.

4. Claims 6 is ejected under 35 U.S.C. 103(a) as being unpatentable over **Reynolds et al. (US 5,547,537), Farnworth et al. (6,150,828) and Bartschat et al. (US 4,980,971)** in view of **Gilmore et al. (US 6,707,552)**.

As to claim 6, the combination of **Reynolds et al., Farnworth et al. and Bartschat et al.** discloses everything above except wherein the first imaging device is provided at the moving device. However, **Gilmore et al.** discloses in Figure 3 wherein the imaging device (26) is provided in the moving device (48).

It would have been obvious for one ordinary skill in the art at the time the invention was made to modify the combined teachings of **Reynolds et al., Farnworth et al. and Bartschat et al.** by having the imaging device in the moving device as taught as **Gilmore et al.** to make the system more cost-effective and to reduce the size of the testing system.

5. Claim 19 is ejected under 35 U.S.C. 103(a) as being unpatentable over **Reynolds et al. (US 5,547,537), Farnworth et al. (6,150,828) and Bartschat et al. (US 4,980,971)** in view of **Roy et al. (US 5,956,134)**.

As to claim 19, the combination of **Reynolds et al., Farnworth et al. and Bartschat et al.** discloses everything above except wherein the moving device can move the picked up DUTs in any direction and can rotate them in any direction. However, **Roy et al.** discloses in Figure 3 a moving device (44) can

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move the picked up DUTs (12) in any direction (X,Y,Z) and can rotate (as shown by arrow on top of 42 in Figure3) them in any direction (Col. 5 Ins 19-37).

It would have been obvious for one ordinary skill in the art at the time the invention was made to modify the combined teachings of **Reynolds et al.**, **Farnworth et al. and Bartschat et al.** by having a moving device that can move DUT in any direction as taught as **Roy et al.** to make the system more cost-effective by not limiting to be a linear or parallel testing.

6. Claims 7-8,10-12 and 14-16 are ejected under 35 U.S.C. 103(a) as being unpatentable over **Reynolds et al. (US 5,547,537)**, **Farnworth et al. (6,150,828)** and **Bartschat et al. (US 4,980,971)** in view of **Ham et al. (US 6,873,169)**.

As to claims 7 and 8, the combination of **Reynolds et al.**, **Farnworth et al. and Bartschat et al.** discloses everything above except a test plate having substantially smooth holding surfaces for holding the back surfaces of the DUTs, wherein the moving device places the DUTs on the holding surfaces of the test plate having suction device so as to relatively correspond to the array of the contact units, and the input/output terminals of the DUTs electrically contact the corresponding contact units of the test head in the state with the DUTs held by the holding surfaces of the test plate in a positional relationship corresponding to the array of the contact units. However, **Ham et al.** discloses in Figures 1-4C a test plate (100) having substantially smooth holding surfaces (bottom side of 120 facing 101) for holding the back surface (surface of 101 where input/output terminals 101a are not led out and is facing 120) of said DUTs (101), moving

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device places the DUTs (101) on the holding surfaces (bottom side of 120 facing 101) of said test plate (100) having suction device (122) so as to relatively correspond to the array of said contact units (164, Col. 4, Ln 51 through Col. 5, Ln 19), and the input/output terminals (101a) of the DUTs (101) electrically contact the corresponding contact units (164) of the test head (160) in the state with the DUTs (101) held by the holding surfaces (bottom side of 120 facing 101) of the test plate (100) in a positional relationship corresponding to the array of the contact units (164).

It would have been obvious for one ordinary skill in the art at the time the invention was made to modify the combined teachings of **Reynolds et al.**, **Farnworth et al.** and **Bartschat et al.** by having a test plate with holding surfaces and suction device as taught as **Ham et al.** to allow the system to perform testing to the DUT's accurately and with a good alignment between the contact units of the system.

As to claim 10, the combination of **Reynolds et al.**, **Farnworth et al.** and **Bartschat et al.** discloses everything above except wherein the test plate has holders provided in a freely movable manner and the holding surfaces are the top surface of the holders. However, **Ham et al.** discloses in Figures 1-4C wherein the test plate (100) has holders (140,150) provided in a freely movable manner (movable back and forth as disclosed in Col. 4 lns 5-9) and the holding surfaces are the top surface of the holders (140,150, as shown in Figure 4B).

It would have been obvious for one ordinary skill in the art at the time the invention was made to modify the combined teachings of **Reynolds et al.**,

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Farnworth et al. and Bartschat et al. by having holders in a freely movable manner as taught as **Ham et al.** to allow DUT's to be hold and release in an easy way.

As to claims 11 and 12, the combination of **Reynolds et al., Farnworth et al. and Bartschat et al.** discloses everything above except wherein the contact units are provided with guide parts in their vicinities and the holders of the test plate are guided by the guide parts and wherein the guide parts have at least two guide surfaces extending in mutually nonparallel directions. However, **Ham et al.** discloses in Figures 1-4C the contact units (164) are provided with guide parts (162) in their vicinities and the holders (140,150) of the test plate (100) are guided by the guide parts (162, Col. 5 lns 20-30) and wherein the guide parts (162) have at least two guide surfaces (one in the X direction and the other in Y direction) extending in mutually nonparallel directions.

It would have been obvious for one ordinary skill in the art at the time the invention was made to modify the combined teachings of **Reynolds et al., Farnworth et al. and Bartschat et al.** by having guide parts in the contact units as taught as **Ham et al.** to allow the DUT's to be hold and place aligned.

As to claims 14 and 15, the combination of **Reynolds et al., Farnworth et al. and Bartschat et al.** discloses everything above except pushing device having elastic members and being provided at the test plate, to push the holders of the test plate so that the side surfaces of the holders abut against the guide surfaces. However, **Ham et al.** discloses in Figures 1-4C pushing means (170,130,132) having elastic members (132) and being provided at the test plate

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(100), for pushing the holders (140,150) of the test plate (100) so that the side surfaces (154) of the holders (140,150) abut against the guide surfaces (162, Col. 4 ln4 – Col. 5 ln 30).

It would have been obvious for one ordinary skill in the art at the time the invention was made to modify the combined teachings of **Reynolds et al.**, **Farnworth et al. and Bartschat et al.** by having pushing means on the test plate as taught as **Ham et al.** to allow the DUT's to be hold and place aligned with the test head to performed electrical testings.

As to claim 16, the combination of **Reynolds et al.**, **Farnworth et al. and Bartschat et al.** discloses everything above except further comprising a positioning plate (110) configured to position the holders (140,150) of the test plate (100), wherein the moving device places the DUTs (101) on the holders (140,150) of the test plate (100) while correcting their positions and postures in the state with the positioning plate (110) positioning the holders of the test plate.

It would have been obvious for one ordinary skill in the art at the time the invention was made to modify the combined teachings of **Reynolds et al.**, **Farnworth et al. and Bartschat et al.** by having a positioning plate to position the holders as taught as **Ham et al.** to allow the DUT's to be hold and place aligned with the test head to performed electrical testings.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Reynolds et al. (US 5,547,537)**, **Farnworth et al. (6,150,828)**, **Bartschat et al.**

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(US 4,980,971) and Ham et al. (US 6,873,169) in view of Neo et al. (US 2003/0041656).

As to claim 9, the combination of **Reynolds et al., Farnworth et al., Bartschat et al. and Ham et al.** discloses everything above except wherein the holding surfaces of the test plate hold the DUT's in the state with the input/output terminals of the DUTs directed vertically upward. However, **Neo et al.** discloses in Figure 2 wherein the holding surfaces (123) of the test plate (120) hold the DUT's (130) in the state with the input/output terminals (134) of the DUTs directed vertically upward (as shown in Figure 2).

It would have been obvious for one ordinary skill in the art at the time the invention was made to modify the combined teachings of **Reynolds et al., Farnworth et al., Bartschat et al. and Ham et al.** by having the input/output terminals of DUT vertically upward as taught as **Neo et al.** to test the DUTs in the same way they are fabricated and to avoid to have a reverse DUTs mechanism in the system therefore reducing size and cost of the system.

Prior Art

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Frye, Jr US Pat # 5,481,202; Hori US Pat # 5,946,409; Hoshi US Pat # 5,113,132; Kim US Pat # 5,694,219 and Ando et al. US Pat # 5,084,959.

Allowable Subject Matter

9. Claims 13,17 and are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

As to claim 13, the prior art of record taken alone or in combination fails to teach wherein the moving means places the DUTs on the holders of the test plate after correcting the positions and postures of the DUTs so that the distances from the side surfaces of the holders abutting against the guide surfaces to the DUTs become substantially equal to the distances from the guide surfaces in the vicinities of the contact units to the contact units.

As to claim 17, the prior art of record taken alone or in combination fails to teach wherein the positioning plate is formed so that the openings in which holders of the test plate can be inserted correspond to the array of contact units of the test head, and the moving means places the DUTs at the holders of the test plate while correcting their positions and postures in the state with the side surfaces of the holders of the test plate abutting against the inside walls of the openings of the positioning plate.

Claim 18 depending from claim 17 is objected for the same reason.

Reasons for Allowance

11. Claims 4 and 23 are allowed.

12. The following is an examiner's statement of reasons for allowance:

Claim 4 recites an electronic device test apparatus for testing DUTs by pushing their input/output terminals against contact units of a test head comprising a calculating device configured to calculate the position and posture of the input/output terminals of the DUT before being picked up by the moving device from the image information captured by the first imaging device, calculate the position and posture of the outside shape of the back surface of the DUT before being picked up by the said moving device from the image information captured by the third imaging device means, calculate the position and posture of the outside shape of the back surface of the DUT picked up by the moving device from the image information captured by the second imaging device, and calculate the position and posture of the input/output terminals of the DUT picked up by the moving device based on the results of these calculations, in combination with other elements of the claim.

Claim 23 recites a method for testing DUTs pushing their input/output terminals against contact units of a test head comprising calculating the position and posture of the input/output terminals of the DUT before being picked up by the moving device from the first image; calculating the position and posture of the outside shape of the back surface of the DUT before being picked up by the moving device from the third image; calculating the position and posture of the outside shape of the back surface of the DUT picked up by the moving device from the second image and calculating the position and posture of the input/output terminals of the DUT picked up by the moving device based on the results of these calculations, in combination with other elements of the claim.

These features taken alone or in combination are neither disclosed nor suggested by the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

13. Applicant's arguments with respect to claims 2,5-19 and 21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

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the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ARLEEN M. VAZQUEZ whose telephone number is (571)272-2619. The examiner can normally be reached on Monday to Friday, 7am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ha Nguyen can be reached on 571-272-1678. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. M. V./
Examiner, Art Unit 2829
08/28/2008

/Ha T. Nguyen/

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Supervisory Patent Examiner, Art Unit 2829